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Development and international cooperation in the twenty-first century: the role of information technology in the context of a knowledge-based global economy

Contribution of the Economic Commission for Europe to the theme for the high-level segment of the substantive session of 2000 of the Economic and Social Council

Development and international cooperation in the twenty-first century: the role of information technology in the context of a knowledge-based economy

A regional perspective

Summary

The President of the Economic and Social Council for the year 2000, in consultation with the Bureau, requested the regional commissions to hold regional intergovernmental or expert group meetings on information technology for development in their respective regions and to report on the outcome of these meetings to the high-level segment of the Council in order to provide a regional perspective on the theme for the high-level segment, entitled "Development and international cooperation in the twenty-first century: the role of information technology in the context of a knowledge-based economy".

All five regional commissions have submitted brief reports based on regional consultative meetings or on views solicited from their member States. The meetings of the ESCAP and ECLAC regions were hosted by the Governments of India and Brazil, respectively, on 20 and 21 June 2000. For its part, ECA held a high-level meeting, as the first African Development Forum, from 24 to 28 October 1999 under the theme "The challenge to Africa of globalization and the information age". ESCWA held its expert group meeting on 15 and 16 May 2000. ECE circulated a draft report to all its member States and comments received are integrated in the Commission's report to the Council.

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Information technology, globalization and development: challenges and opportunities in the region of the Economic Commission for Europe

Selected issues

I. Introduction

1. Rapid progress and expansion of information and communication technology (ICT) has been the hallmark of human civilization development in the last decade of the twentieth century. It has dramatically changed ways of doing business, profoundly affected economic and social life and rendered the established concepts of national independence and sovereignty largely obsolete. ICT development has also been one of the most important driving forces behind the process of globalization. As with every major technological advance, the ICT revolution opens new vast opportunities but also poses challenges and risks. It is a chance, not a gift. Those who fail to seize the new opportunities risk falling behind.

2. This summary paper gives a brief overview of the implications of ICT for economic and social development in the member countries of the Economic Commission for Europe (ECE) and suggests appropriate policy responses. It shows that ICT can stimulate economic growth by adding new products, increasing productivity and introducing new management and marketing techniques. On the other hand, rapid expansion of ICT may also lead to some negative developments, including the risk of further widening the economic disparities between and within countries in the ECE region.

3. The paper argues that specific policy actions are needed both at the national and regional levels to prevent the "digital divide", to contain possible negative effects of ICT and to help the less advanced countries to benefit fully from the ICT revolution. These actions would include measures aimed at expanding "digital connectivity" across societies and upgrading the skills and knowledge levels of less advanced countries and social groups in the ECE region. They would also include regulatory measures to increase the security and efficiency of ICT applications, in particular Internet-based businesses. Such policy actions in the context of a national ICT programme are suggested in the paper. ECE is well placed to be instrumental in sharing good practices in ICT applications in its areas of work and in providing technical assistance to transition economies in their efforts to develop national strategies of ICT development and use.

II. ICT and globalization

4. In its essence, globalization means dramatically increased international interdependence and an urgent need for much more international cooperation. Links between ICT and globalization are frequently emphasized. Indeed, ICT is a vehicle of globalization. It reduces the cost and increases the speed of communication, thereby allowing for faster and cheaper transactions, as well as for decentralization and more efficient spatial distribution of many manufacturing activities within integrated production networks involving many countries. In Europe, application of electronic documentation and reporting in customs procedures helps to remove many technical barriers to international trade. Through its impact on the speed and scope of commercial transactions, ICT enhances globalization and economic integration in the ECE region and worldwide. International integration, in turn, establishes an enabling environment for ICT development and diffusion.

5. But globalization is not yet truly global. In the ECE region, expansion of trade and foreign direct investment (FDI) is much faster within the European Union and the more advanced transition countries. Many less advanced countries in south-east Europe and the Commonwealth of Independent States (CIS) do not, for various reasons, significantly benefit from the ICT-based economic integration and the process of globalization in general (though they may painfully feel some of its adverse consequences, such as currency crises or fluctuations of commodity prices).

III. ICT and economic growth

6. No doubt, ICT can produce important economic and social benefits. New technologies improve economic efficiency and open up new business

opportunities, facilitate diffusion of technical progress and new ideas and establish direct links between people and enterprises across different countries and regions. They stimulate scientific progress, open new possibilities for acquiring education and knowledge and enrich human choices. ICT is also at the heart of the "new economy" paradigm that attempts to explain the recent astonishing economic growth performance in the United States of America, mainly through productivity gains arising from the rapid and universal development and diffusion of ICT.

7. The impact of ICT on economic growth works through three main channels. First, it expands total output directly through adding new goods and services — such as computers, software, magnetic card machines, mobile phones, satellite TV and new financial services. Second, it increases productivity through innovations in the existing production processes, such as the use of computer-guided robots, application of new software, electronic commerce or wireless communications. Third, ICT applications improve overall efficiency through innovations going beyond the production process proper; these include new methods of management, sales, organization and marketing, such as cross-border production networking, "outsourcing" or advertising and sales through the Internet.

8. Production of ICT goods and services has been expanding rapidly in the last decade. There are no systematic statistics for the ECE region, but partial data indicate that the share of ICT goods in gross domestic product (GDP) increased in most countries by 0.5 to 2 percentage points between 1993 and 1997. Even faster has been the expansion of certain ICT-based services, such as data communication, e-business services, software, systems design and integration and consulting.

9. ICT-based process innovations (such as the application of computers and digital communication systems) help to improve labour productivity and quality of products. Firm-level productivity data reveal that information technology has a positive impact on marginal output. Recent studies have shown that growth in computer use in the United States economy in 1992-1996 contributed between 0.32 and 0.60 of a percentage point to total output growth. In countries such as the United States, the United Kingdom of Great Britain and Northern Ireland and Canada, the contribution of ICT capital to output growth accounted for over one half of the total growth contribution of fixed capital during 1990-1996. Similar efficiency effects can be expected to emerge in services. In trade, shifting sales from traditional retail networks to electronic networks (Internet) allows consumers to save the time they spend on searching for goods, while producers and distributors economize on stocks and on the costs of maintaining necessary commercial space.

10. As regards the organization of production activities, ICT allows for removing traditional spatial barriers in production and opens up new possibilities for geographical decentralization of production, with different production phases located in separate places offering the best economic and business conditions but still functionally integrated through ICT. An important implication of this tendency is that it enhances the role of small and medium-sized enterprises (SMEs) as they obtain more opportunities to become integrated through "outsourcing" and subcontracting into the activities of large corporations.

11. One important and promising sequel to the rapid ICT development in this area is the tendency to shift some highly sophisticated ICT-based activities to low-cost countries. In the past, many infotech companies from western Europe and North America subcontracted increasingly large parts of their software application services to countries such as Ireland or Israel. This pattern of subcontracting can spread very quickly to the transition countries of eastern Europe, where education levels are relatively high and the basic communication infrastructure is in place. Cross-border outsourcing and subcontracting has already been evident in more advanced countries (such as Hungary, the Czech Republic or Estonia).

12. Rapid development of ICT-based financial services has dramatically increased international capital mobility. This allows for better allocation of financial resources in the whole ECE region and worldwide, but may also lead to foreign exchange rate instability and currency crises. The "tides" of international financial capital that take place instantaneously through electronic means are driven by largely subjective perceptions by investors of differentials in the national risk-adjusted rates of return on assets. The massive flows may be particularly destabilizing for small open economies in transition, leading to very wide fluctuations in nominal and real exchange rates and, consequently, inflicting considerable damage on the real sector.

13. Large efficiency gains can be obtained through wider and deeper applications of ICT across-the-board in the economy and society. All sectors are likely to gain from ICT development, not only those directly producing ICT, even though most technologically advanced sectors will probably gain much more than traditional sectors. Moreover, ICT applications also promise large gains in other, non-economic sectors, such as education, health care and public administration.

14. Probably the largest potential for exploiting new opportunities exists in mass education, including primary and secondary schools as well as vocational training. Computer literacy and broad access to the Internet open practically unlimited education possibilities for all, establishing a basis for a knowledge-based society. True, some minimum level of knowledge is always required to effectively exploit those possibilities, but on the other hand access to the Internet is itself knowledge-stimulating and enhances self-education.

IV. ICT and economic inequalities: the risk of a "digital divide"

15. By its very nature, ICT applications are not universally and equally spread. Available statistics show that ICT intensity is generally higher in the countries with a higher level of economic development as measured by GDP per capita. This implies that the more developed countries can also gain proportionately more from ICT. The benefits are likely to accrue mostly to the main users, including high-tech and knowledge-intensive sectors, such as sophisticated manufacturing, financial and medical services, media and entertainment, electronic commerce, research and development. Given the generally higher share of those sectors in developed countries economies, the gains may be absolutely and relatively higher in those countries. This raises the risk of a "digital divide" in the ECE region and worldwide.

16. In Europe, this challenge has acquired an important regional dimension, arising from the rapidly expanding interrelations between the more affluent and ICT-advanced countries of western Europe on the one side, and much poorer countries with economies in transition being at varying stages of reforms on the other side. Catching up with the western European income and wealth levels is an important goal for the acceding countries and a component of the European Union's enlargement strategy. It is also essential to ensure a balanced development of ICT in the region as a whole so that the other countries with economies in transition are not left behind.

17. There are instances where ICT applications seem to narrow, rather than widen, the existing inequalities. For example, by opening up more opportunities for SMEs and self-employed individuals through outsourcing and subcontracting and by lowering barriers to entry in many industries, ICT may contribute to a more balanced distribution of growth effects across the whole economy. Similarly, allowing for more spatial dispersion of production activities (deglomeration), ICT may facilitate economic development of many rural and backward areas.

18. Demand-side statistics on ICT uses are still scarce and fragmentary but available data show large imbalances in the consumers' structure. The use of ICT equipment has been concentrated in higher-income segments of the market, mostly among wealthy individual and institutional consumers and investors. There are obvious reasons for this unequal distribution. First, there is a price barrier: ICT products are still relatively expensive. Second, the professional use of ICT-based products is naturally concentrated in high-skills professions and high-tech sectors (banking, media, electronics and telecommunications) where incomes generated are generally higher. Third, the use of ICT-based products increases with the level of education and knowledge, which in turn is correlated with the income levels. This pattern suggests that ICT-generated gains tend to concentrate in the countries, sectors and social groups with higher levels of incomes and education.

19. Data on Internet hosts and Internet users confirm the positive correlation between Internet use intensity and per capita incomes. The number of Internet users in European Union member countries is generally higher, relative to total population, than in transition countries, although there are some important exceptions (for example, Estonia and Slovenia). Similar disparities are evident among the transition countries. ICT production and application, including especially Internet installation and uses, is much better developed in the most advanced transition countries, such as Hungary, the Czech Republic, Estonia, Slovenia and Slovakia. While this pattern again

confirms that income levels are important, there are two other factors that help to explain the differences: FDI inflows and national policies.

20. More advanced transition countries have attracted much higher FDI inflows than other countries, especially in ICT-intensive sectors such as telecommunication and banking. Data for the ECE region show a positive correlation between Internet intensity and FDI intensity. Acquisitions of domestic enterprises by foreign companies under national privatization programmes allowed for their rapid modernization, including wider applications of ICT. This has had a direct and sizeable positive impact on overall productivity.

21. Apart from FDI and income differentials, another important reason for the considerable disparities among transition countries are simply different policy priorities adopted by national Governments. For instance, while countries such as Estonia and Hungary have followed an explicit policy of rapid Internet development, most of CIS countries have not yet considered ICT to be an important priority or have failed to translate this priority into concrete policy actions. Differences in national policies with respect to ICT development can also be discerned from international comparisons of prices for Internet access. Available data show wide disparities in the Internet access prices in the ECE region, with access charges in the transition countries being generally much higher than in the more developed ECE countries. The data show also that countries with low access charges have generally higher Internet intensity.

V. ICT and economic and social risks

22. Accelerated ICT development and, especially, Internet applications are likely to have an important impact on the tax revenues of individual Governments. For instance, within the European Union customers may shift their purchases to countries where indirect taxes are lower. Moreover, sales of some "virtual" products (such as music, movies and software) are not taxed at all. Effective tax collection may become more difficult because of the anonymity of buyers and also because of specific regulations in some countries that forbid taxes on Internet sales (for example, the Internet Tax Freedom Act of 1998 in the United States).

23. ICT and globalization have made individual national economies much more dependent on each other and on global trends. Traditional concepts of national sovereignty and independence need to be revised. Political elites need to learn how to adjust their political programmes and attitudes to the new situation. A key policy challenge is how to benefit from increased openness while at the same time reducing and controlling the risks, including susceptibility to financial crises and a backlash from nationalist and isolationist sentiments.

24. Internet, satellite TV and digital communication have accelerated the universal dissemination of ideas, values and behaviour patterns that mostly originated in rich countries and reflect essentially the western culture. Generally, the form and content of electronically transmitted information is neither controlled nor restricted. The rapid expansion of a "global culture" may conflict with traditional values that are at the roots of local communities in less advanced countries, for example, in the Balkans and in the CIS. This may result in accelerated and sometimes violent disintegration of those communities, entailing a number of social tensions and other phenomena, such as xenophobia, illegal migration, criminality and drug abuse.

25. In trade via the Internet, consumer rights and security of transactions are not always well protected. Regulatory frameworks for electronic commerce in most countries are still in *statu nascendi*. Rapid development of ICT has opened up possibilities for new forms of crimes: fraud, electronic theft, illegal data copying and use, breach of confidentiality with respect to classified information, virus infections and sabotage ("cyber-crimes"). The recent attacks on the portals of Internet companies in the United States have demonstrated that the Internet remains a vulnerable and imperfect means of business communication. Moreover, the explosive growth of sales and advertising through the Internet may distort the consumption patterns.

VI. The need for policy actions

26. The opportunities and challenges involved in ICT development call for policy and regulatory actions aimed at ensuring that all potential of ICT can best serve human development objectives. ICT development and use should be made more universal across

countries, especially in less developed countries and countries with economies in transition. The three fundamental constraints in those countries include: (a) lack of ICT equipment (computers, infrastructure); (b) insufficient level of knowledge and skills needed to operate, use and benefit from ICT; and (c) lack of an appropriate policy and regulatory framework to enhance and support ICT application while preventing negative effects. Paragraphs 27 to 34 suggest a set of policy directions with a view to overcoming these constraints and thereby maximizing the opportunities offered by ICT.

27. Limited availability of ICT equipment, including Internet infrastructure, is primarily a reflection of a general scarcity of capital resources in less advanced countries. In this sense, it is a part of a more general problem of elaborating and implementing a long-term development strategy required for sustained rapid economic growth. A fundamental part of such a strategy would be to establish a supportive institutional and policy environment for business activities in a country. The institutional and regulatory aspects of a successful development strategy were recently re-emphasized by the Secretary-General in his Millennium report. Another strategic policy objective should be to develop mass education and training with the aim of building a knowledge-based society. Only such a society can be expected to prosper in the long run through sustained economic growth generated by knowledge- and skill-induced productivity gains.

28. One possible policy initiative for the transition countries would be to adopt national ICT development programmes organized around two main objectives: raising education levels and expanding "connectivity".

29. School programmes should include more courses on computer uses and Internet applications at all levels. Access to training programmes on computer uses and Internet applications should be offered free of charge to the target groups, including students, school teachers, SMEs, local government officials and the unemployed. Communal "hubs" for Internet access (in schools, libraries and local cultural centres) should be sponsored by the Government.

30. An important precondition for rapid diffusion of ICT and Internet applications is a well-developed telecommunications infrastructure. National Governments should liberalize markets for telecom services and contribute to developing fast and inexpensive "connectivity". The recent rapid expansion of mobile telecommunications gives the less advanced countries a chance to close the gap in the traditional fixed-line telecommunication systems.

31. It is now well recognized that Internet access should be offered at subsidized prices or free of charge, especially to the target groups (students, SMEs and local communities). But this conflicts with the predominantly private ownership and operation of the existing Internet infrastructure. While ICT development and Internet applications have so far been private-sector driven, they are increasingly perceived as public goods. A solution should be sought in a balanced public-private partnership and broader involvement of public authorities, including information campaigns, deregulation of monopolies, financial incentives and direct subsidies.

32. Rapid expansion of ICT applications calls for a coherent regulatory framework to minimize the risks of social tensions and pathologies, and to ensure that ICT contributes best to economic and human development. In the area of Internet-based trade, the required regulations would cover the rights and obligations of parties in e-contracts, protection of private banking and personal data, information content, protection of intellectual property rights, effective supervision and control of Internet use. At the same time, the adopted regulatory framework should not be excessively restrictive and must not inhibit market competition or further innovations. Close collaboration with business communities is strongly desired in this area.

33. An important area of ICT applications is public administration. Establishing direct communication with citizens via the Internet, Governments can improve the quality of public services, increase accountability and transparency of government decisions, provide better information on their activities and obtain valuable feedback reactions from the citizens. Developing "e-government" can contribute to making bureaucracy leaner and more efficient and help fighting pathologies such as corruption and cronyism (for example, in public procurement).

34. An important task for Governments in the ECE region would be to elaborate and enforce a system of statistical data collection on ICT, especially in areas such as electronic commerce. In this area, uniform standards of reporting could be developed and applied across the ECE region.

35. A number of ECE countries have taken major steps in adopting ICT-related policies. The case of Ireland is a good example. As a result of the Irish Government's strategy of encouraging FDI, 7 out of the world's top 10 software companies had production facilities in Ireland in 1997. By 1998, Ireland had become the second largest world exporter of packaged software, with the total amount of revenues generated by the software sector exceeding US$ 7.4 billion and the export value of US$ 6.6 billion. The success was a combined outcome of good macroeconomic policies, liberal business-friendly microeconomic policies and the availability of high-skilled, dedicated manpower.

36. Another example to follow is that of Estonia. Within only a few years, the country has become the leader in Internet use in eastern Europe. A political consensus has been reached by major political parties to spend each year 0.2 per cent of GDP on developing Internet access, in particular in primary and secondary schools. This well-focused policy has become a national priority. The programme, called "The Tiger Leap", was launched in 1995. By May 2000, more than 70 per cent of Estonian schools had direct access to the Internet.

37. The national policy should be buttressed by appropriately structured international assistance, with special programmes targeted at various ICT applications, training and sharing best practices and experiences of more advanced countries in the area of telecommunication policies or electronic commerce regulations.

VII. The role of the Economic Commission for Europe

38. Over the years, ECE has accumulated considerable expertise in many ICT-related areas. Among many important projects implemented under its auspices, two deserve special attention. The first is UN/CEFACT, an initiative to facilitate business processes through recommendations aimed at applying information technologies in business activities and reducing the procedural, legal and physical constraints to them. The second is the Internet Enterprise Development Project, initiated in 1998 and focused on exploring the central issues in electronic commerce and Internet-based enterprise development.

39. Building upon the experience from these and other activities, ECE as a regional organization, with its Euro-Atlantic membership and focus on transition countries, can be the forum for discussing region-wide initiatives to address various aspects of ICT development. Bringing together national Governments, business leaders, the media, representatives of consumer groups and international organizations, ECE could act as a platform for sharing good policy practices and experiences between more developed and less developed member countries and raise public awareness of the opportunities and risks connected with ICT.

40. The ECE could adopt a long-term approach by strengthening the ICT dimension in all its areas of work, in particular trade, statistics and transport. This would include ICT-related activities for all countries of the region (particularly in the field of standards-setting) as well as ICT capacity-building activities targeted at economies in transition. The possibility of a long-term programme of activities along these lines could be examined by the Commission in the light of the views and directions emerging from the high-level segment of the substantive session of 2000 of the Economic and Social Council.

41. Such a programme should be part of a collective action and standardized approach in this area, through synergies with other regional and subregional initiatives such as the "Europe — An Information for All" initiative of the European Union and through coordination with other concerned international organizations, in particular the World Trade Organization, the World Intellectual Property Organization and the International Telecommunication Union.